



Use of Final Diagnosis Data for Surveillance of Respiratory Syncytial Virus



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OBJECTIVE

- To analyze final diagnosis data available to BioSense and determine its potential utility for surveillance of respiratory syncytial virus (RSV) illness.

BACKGROUND

- BioSense is a Centers for Disease Control and Prevention (CDC) national near real-time biosurveillance system.
- The BioSense system receives patient level clinical data from more than 370 hospitals and 1100 ambulatory care Departments of Defense (DoD) and Veterans Affairs (VA) medical facilities. These data are analyzed, visualized, and made simultaneously available through the interactive web-based BioSense application to public health at the local, state, and federal levels, as well as the facilities sending data.
- Patient chief complaints and diagnoses are assigned as appropriate to 11 syndromes and 78 sub-syndromes, including RSV.
- Among infants and children less than 1 year of age, RSV is the most common cause of bronchiolitis and pneumonia; 0.5% to 2% require hospitalization.¹
- Increasingly, RSV is also recognized as a major cause of pneumonia in elderly adults.²

METHODS

- We identified patient visits meeting the final diagnosis-based RSV sub-syndrome definition:
 - Free text diagnosis of RSV or RSV ICD-9 codes of 466.11 (RSV acute bronchiolitis), 079.6 (RSV), or 480.1 (RSV pneumonia), and
 - No associated RSV vaccination code (V04.82)
- We examined VA and DoD data from 7/01/04 to 4/31/07 and hospital data from 7/1/06 to 4/31/07.
- We were unable to de-duplicate DoD patient visits due to lack of a longitudinal patient identifier, but did de-duplicate hospital and VA patients.
- We analyzed ICD-9 code frequencies, distributions of patient demographics, and temporal trends.
- Among hospital patients with a final diagnosis of RSV, we also examined available outpatient reason for visit, emergency department (ED) chief complaint, and inpatient reason for admission based sub-syndromes.
- Temporal trends in BioSense data were compared to trends in percent positive RSV laboratory antigen detection and virus isolation tests from the CDC National Respiratory and Enteric Virus Surveillance System (NREVSS).³

RESULTS

- During the study period we identified 2985 hospital patients, 201 VA patients, and 13,214 DoD visits with an RSV final diagnosis from 49 states and 2 US territories (Table 1).
- The most frequent RSV ICD-9 code was 466.11 (RSV acute bronchiolitis). The proportion of 480.1 (RSV pneumonia) diagnoses was higher among VA patients (Table 1).
- Children less than 1 year of age comprised the majority of hospital patients and DoD visits, while VA patients were primarily elderly adults (Table 1).
- Among hospital patients, 48% were diagnosed while inpatients, 39% in the ED, and 13% as outpatients.
- Among hospital patients with an RSV final diagnosis, ED patients primarily reported chief complaints of fever, cough, or dyspnea, while inpatients were admitted primarily for bronchitis and bronchiolitis or RSV (Figure 1).
- DoD and hospital RSV patient visits exhibited seasonal trends similar to NREVSS. Visits were low during summer, increased during fall, peaked during winter, and declined during spring. DoD patient visits began to increase slightly earlier than hospital visits (Figure 2).
- Due to low counts, VA RSV rates did not demonstrate prominent seasonal trends.

Table 1. Descriptive results by data source, 7/1/2004 to 4/31/2007.

Data Source	Number of Facilities with ≥1 RSV Patient Visit	Number of Patient Visits with RSV	Percent of RSV Diagnoses with 480.1 (RSV pneumonia)	Percent of RSV Patient Visits with Age <1 year
Hospital	69	2985	5%	62%
VA	94	201	24%	2%
DoD	267	13,214	5%	71%

Figure 1. Among hospital patients with an RSV final diagnosis, most frequent ED chief complaint and inpatient reason for admission based sub-syndromes by patient class, 7/1/2007 to 4/31/2007

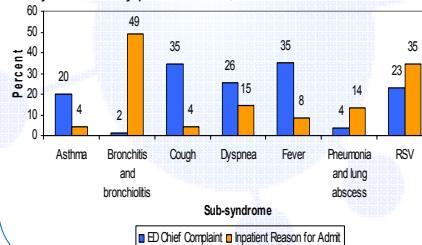
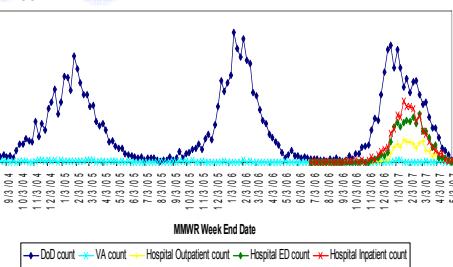


Figure 2. Hospital, DoD, and VA patient visits with an RSV final diagnosis by data source and MMWR week, 7/1/2007 to 4/31/2007



DISCUSSION

- Limitations of this analysis include:
 - The lack of a DoD patient identifier, which can result in a single patient being represented by multiple visits.
 - The data reflect specific populations and geographic areas.
 - ICD-9 code assignment can be influenced by medical billing practices.
- Temporal trends in hospital and DoD data were highly seasonal and similar to trends observed in CDC NREVSS laboratory-based RSV surveillance.
- VA data did not demonstrate seasonal trends, but may offer an opportunity for surveillance for severe RSV-associated respiratory illness in older adults.
- ICD-9 codes are often associated with a period of latency between the time of the patient visit and when the data are available to BioSense. However, these are no longer than reporting delays in CDC NREVSS.³
- We conclude that final diagnosis data in BioSense could be a useful adjunct for surveillance of RSV.

REFERENCES

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